

# Claims

- [c1] 1. A hull for vessels comprising an exterior surface, an interior surface under the hull's waterline and propulsion means, wherein  
said exterior surface has a substantially constant cross section along the length of the hull,  
said interior surface substantially encloses a flow channel for the length of the hull, the interior surface further comprising a converging-diverging diffuser, and  
said propulsion means is at least one of a rocket motor water-jet drive, said water jet drive comprising at least one of
- a) a water inlet in the converging portion or middle throat of the diffuser in communication with a pump, which is in communication with a water outlet in the diverging portion of the diffuser, and
  - b) a water inlet drawing water from outside the exterior surface in communication with a pump, which is in communication with a water outlet in the diverging portion of the diffuser.
- [c2] 2. The hull of claim 1, wherein said exterior surface has a cross section of a regular geometric shape taken from

the group consisting of a rectangle, hexagon, octagon, decagon, circle, and oval.

- [c3] 3. The hull of claim 2, wherein said diffuser is formed by converging and diverging surfaces on opposite sides of said geometric shape.
- [c4] 4. The hull of claim 3, wherein one of said opposite sides is a side of said geometric shape that is nearest the waterline, and the opposite side is near of the deepest part of the hull when the vessel is in water.
- [c5] 5. The hull of claim 3, wherein one of said opposing surfaces is nearest the waterline, and the other opposing surface is near the deepest part of the hull when the vessel is in water.
- [c6] 6. The hull of claim 5, wherein the converging-diverging surface that is nearest the waterline is adapted to hold a vessel's cargo.
- [c7] 7. The hull of claim 5, wherein the converging-diverging surface that is near the deepest part of the hull is adapted to hold a vessel's ballast.
- [c8] 8. A hybrid hull for vessels comprising an exterior surface, an interior surface under the hull's waterline, and propulsion means, wherein

said exterior surface is not substantially constant cross section along the length of the hull,  
said interior surface substantially encloses a flow channel for the length of the hull, the interior surface further comprising a converging-diverging diffuser and a displacement hull.

[c9] 9. A hull for ice breaking vessels comprising an exterior surface, an interior surface under the hull's waterline, a plow, and propulsion means,  
said interior surface substantially enclosing a flow channel for the length of the hull, the interior surface further comprising a converging-diverging diffuser,  
said plow secured to and axially aligned to the bow of the hull, and  
said plow comprising a structure having a surface that is raised along the centerline of the hull and lower nearest the sides of the hull, under the hull's waterline at the bow, and over the hull's waterline aft.

[c10] 10. The hull of claim 9, wherein said plow is substantially convex.

[c11] 11. The hull of claim 9, wherein the plow is shaped substantially as a chevron.

[c12] 12. The hull of claim 9 further comprising a blade dis-

posed at the peak of the raised structure adapted to score the ice for initiating a crack that facilitates ice breaking.

[c13] 13. The hull of claim 12, said blade comprising serrated teeth.

[c14] 14. The hull of claim 12, said blade comprising a sharp edge.

[c15] 15. The hull of claim 12, further comprising a plurality of spaced wedges secured to the plow and adapted to score the underside of an ice sheet.

[c16] 16. The hull of claim 12, further comprising a plurality of spaced hinged wheels secured to the plow and adapted to score the underside of an ice sheet.

[c17] 17. The hull of claim 16, further comprising hydraulic pistons in communication with the plow for locating the wedges.